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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,504	03/01/2004	Dar-Ming Chiang	250913-1140	2741
24504	7590	11/13/2006	EXAMINER	
THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP 100 GALLERIA PARKWAY, NW STE 1750 ATLANTA, GA 30339-5948			DESAI, ANISH P	
			ART UNIT	PAPER NUMBER
			1771	

DATE MAILED: 11/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/791,504

Applicant(s)

CHIANG ET AL.

Examiner

Anish Desai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 18-53 is/are pending in the application.
- 4a) Of the above claim(s) 18-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 39-53 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

The applicant's arguments in response to the Office action dated 05/18/06 have been fully considered.

1. Claims 18-53 are pending. Claims 18-38 are withdrawn. Claim 39 is amended and claim 53 is a newly added claim. Support for amended claim 39 and newly added claim is found in the specification.
2. The newly added amendment to the specification is reviewed and is entered because the amendment does not change the scope of the invention.
3. The 112 claim rejections are withdrawn in view of the present amendment and response (see pages 13 and 14 of 08/17/06 amendment).
4. Art rejections that are not maintained are withdrawn. A new ground of rejection is made over Chou et al. (US 2003/0054716A1) in view of Yamamoto et al. (US 4,560,737).

### ***Claim Objections***

5. Claim 39 is objected to because of the following informalities: Claim 39 requires "polymer copolymerizing from monomer" and claim 39 recites polyvinylidene fluoride as a monomer, it should be changed to vinylidene fluoride. Note polyvinylidene fluoride is a polymer whereas vinylidene fluoride is a monomer.

***Claim Rejections - 35 USC § 102/103***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 39 recites "VdF as first monomer, and HFP, CTFE, TFE, or combinations thereof as a second monomer." Thus, it is the examiner's position that any reference teaching a polymer obtained by copolymerizing VdF monomer and **either one** of the HFP, CTFE, TFE, or any combinations of HFP, CTFE, and TFE monomer will read on claim 39. Further claims 42-44, 46, and 49 recite "or less", thus it is the examiner's position that said recitation also includes zero as the lower limit, therefore any reference that does not disclose the amount of HFP (claim 42), CTFE (claim 43), TFE (claim 44), third monomer (claim 46), and second polymer (claim 49) will also read on the said claims. Further with respect to claim 39, the recitation "an elecret coated along the porous profile" is interpreted as any reference disclosing elecret coating composition as claimed that is applied to a porous substrate will read on "elecret coated along the porous profile".

6. Claims 39, 40, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chou et al. (US 2003/0054716A1) in view of Yamamoto et al. (US 4,560,737).

Chou teaches a method of making an electret that includes contacting a porous substrate that includes polymer with a composition that includes solvent capable of swelling the polymer, removing the solvent from the substrate, and contacting the substrate with water in manner sufficient to impart electret charge to the substrate (abstract). The porous substrate is a nonwoven fibrous web that include fibers selected from polyolefin, polystyrene etc. (0013). The electrets of Chou are suitable for use in variety of applications including filtering, electro-acoustic devices such as microphones, headphones etc. (0067). Additionally, Chou discloses that in one embodiment, contacting the substrate with the composition includes spraying. In other embodiments, contacting the substrate with the composition includes soaking (0010). Chou is silent as to teaching of electret having a first polymer copolymerizing from monomers having polyvinylidene fluoride as a first monomer, and hexafluoropropylene, chlorotrifluoro ethylene, tetrafluoro ethylene, or combinations thereof as a second monomer (claim 39) and electret is coated on the inner walls of the pores of the porous substrate (claim 53). However, Yamamoto discloses a piezoelectric polymeric material in the form of a sheet or film, which comprises polymers of vinylidene fluoride (VDF) as a principle component. The piezoelectric sheet or film of Yamamoto is formed into an electret (abstract). Further, the piezoelectric polymeric sheet or film of Yamamoto comprises copolymers of VDF and chlorotrifluoroethylene (CTFE) (Column 2, lines 20-21), which

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reads on an electret having a first polymer copolymerizing from monomers having VdF as a first monomer and HFP, CTFE, TFE, or combinations thereof as a second monomer as claimed in claim 39. Further Yamamoto teaches a spreading (coating) of a solution of copolymer (A) and vinylidene fluoride base resin on the substrate at Column 4, lines 21-22. Additionally, Yamamoto teaches that is an object of the present invention to provide an improved piezoelectric polymer material in the form of sheet or film, which exhibits higher modulus of piezoelectricity (column 1, lines 44-47). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to spread (coat) the solution of copolymer (A) and vinylidene fluoride base resin on the porous substrate of Chou, motivated by the desire to improve the piezoelectric property of the electret of Chou.

With respect to claim 53, Chou as modified by Yamamoto is silent as to teaching of electret is coated on the inner walls of the pores of the porous substrate, however it is reasonable to presume that the electret of Chou as modified by Yamamoto necessarily has the electret coated on the inner walls of the pores of the porous substrate because like materials have like properties. Chou as modified by Yamamoto teaches a porous substrate with a coating of electret, which has the same composition as claimed by the applicant. Further since the substrate of Chou is porous, the coating would necessarily flow in the pores of the substrate. Note that reliance upon inherency is not improper even though rejection is based on Section 103 instead of Section 102. *In re Skoner, et al.* (CCPA) 186 USPQ 80.

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7. Claims 39-44, 47,50, 51,and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (US 4,560,737) in view of Chou et al. (US 2003/0054716A1) substantially as set forth in the 05/18/06 Office action.

Yamamoto teaches a piezoelectric polymeric material in the form of a sheet or film, which comprises polymers of vinylidene fluoride (VDF) as a principle component. The piezoelectric sheet or film of Yamamoto is formed into an electret (abstract). Further, the piezoelectric polymeric sheet or film of Yamamoto comprises copolymers of VDF and chlorotrifluoroethylene (CTFE) (Column 2, lines 20-21), which reads on an electret having a first polymer copolymerizing from monomers having VdF as a first monomer and HFP, CTFE, TFE, or combinations thereof as a second monomer as claimed in claim 39. Further Yamamoto teaches a spreading (coating) of a solution of copolymer (A) and vinylidene fluoride base resin on the substrate at Column 4, lines 21-22.

Yamamoto is silent as to teaching of a porous substrate and an electret is coated on the porous substrate along the profile thereof. However, Chou teaches a method of making an electret that includes coating a porous substrate (abstract). Further Chou discloses a substrate formed of nonwoven fibrous web, which includes fibers selected from polyolefin, polystyrene etc. (0021). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the nonwoven porous substrate of Chou in the invention of Yamamoto as a porous substrate because Chou provides necessary details to practice the invention of Yamamoto.

With respect to claims 41 and 43, the Example 1 of Yamamoto discloses 250 g of VDF monomer and 151 g of CTFE monomer that is subjected to polymerization. The chemical formulas of VDF and CTFE are  $C_2H_2F_2$  and  $CF_2=CFCl$  respectively. The molecular weight of VDF and CTFE are 64 g/mol and 116.47 g/mol respectively. Thus, the mole% of VDF in the mixture of VDF and CTFE is about 75 mole% and the mole% of CTFE in the mixture is about 25 mole%, which meets the claim limitations of claims 41 and 43 respectively. Regarding claims 42 and 44, Yamamoto is silent as to teaching of the content of HFP and TFE, which meets the claim limitation of claims 42 and 44. Regarding claim 47, although Yamamoto does not explicitly teach the content of fluorine element in the first polymer is between 60 and 78 wt%, it is examiner's position that as applied to claim 39, the teachings of Yamamoto either explicitly or implicitly teaches the content of the fluorine element in the first polymer to be between 60 and 76 wt%. Because, Yamamoto teaches the same composition (an electret having a first polymer copolymerized from VDF as a first monomer and CTFE as a second monomer) as claimed by the applicant. Thus, it is not seen that the copolymer of VDF and CTFE as taught by Yamamoto would not have the content of the fluorine element from 60 and 76 wt% as claimed.

With respect to claim 50, Yamamoto teaches in case of dissolving method, the copolymer (A) and the vinylidene fluoride base resin are put into a suitable polar solvent such as dimethylformamide (column 4, lines 17-20). Regarding claims 51 and 52, Yamamoto as modified by Chou teaches claimed invention except the initial surface potential of the electret as claimed in claim 51 and a surface potential of electret as



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claimed in claim 52. However, it is reasonable to presume that the piezoelectric sheet or film of Yamamoto as modified by Chou necessarily has the claimed initial surface potential as claimed in claim 51 and a surface potential as claimed in claim 52 because like material has like property. The electret composite of applicant comprises a porous substrate and an electret coated on the porous substrate wherein the electret has a first polymer copolymerized from VdF as a first monomer and HFP, CTFE, TFE, or combinations thereof as a second monomer. Further, the electret of the applicant is polarized by corona discharge. The piezoelectric sheet or film of Yamamoto as modified by Chou as applied to claim 39 also comprises a porous substrate with a piezoelectric sheet wherein the piezoelectric sheet comprises a copolymer of VDF and CTFE. Thus, the initial surface potential as claimed in claim 51 and a surface potential as claimed in claim 52 would have been present. Note that reliance upon inherency is not improper even though rejection is based on Section 103 instead of Section 102. *In re Skoner, et al.* (CCPA) 186 USPQ 80.

8. Claims 45 and 46 are rejected under 35 U.S.C. 103(a) as obvious over Yamamoto et al. (US 4,560,737) in view of Chou et al. (US 2003/0054716A1) as applied to claim 39, and further in view of US 3,607,754 (hereinafter '754).

The invention of Yamamoto is previously disclosed. Yamamoto is silent as to teaching of the third monomer as claimed in claim 45 and the content of the third monomer in the first polymer is approximately 30 mole% or less as claimed in claim 46. However, '754 teaches an electret comprising a resin mixture of vinylidene fluoride resin and methyl methacrylate (abstract). Further '754 teaches that vinylidene fluoride resin

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is particularly interesting as a material for producing electret (column 1, lines 10-12) however the electret prepared by using vinylidene fluoride resin does not always sufficiently maintain electric charges (column 1, lines 27-29). Moreover, '754 discloses that a principal object of this invention is to provide an improved electret and a process of producing an electret having a high surface charge density and excellent maintenance of electric charges. With respect to claim 46, '754 is silent as to teaching of the mole% of methyl methacrylate, thus it reads on the content of the third monomer in the first polymer is approximately 30 mole% or less as claimed in claim 46. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add methyl methacrylate of '754 in the vinylidene fluoride polymer of Yamamoto, motivated by the desire to provide an electret having a high surface charge density and excellent maintenance of electric charges.

9. Claims 48 and 49 are rejected under 35 U.S.C. 103(a) as obvious over Yamamoto et al. (US 4,560,737) in view of Chou et al. (US 2003/0054716A1) as applied to claim 39, and further in view of Allen et al. (US 5,610,455) (hereinafter '455).

The invention of Yamamoto is previously disclosed. Yamamoto is silent as to teaching of second polymer mixed with the first polymer as claimed in claim 48 and the content of the second polymer in the second polymer in the electret is approximately 60 wt% or less. However, '455 teaches electret comprising syndiotactic vinyl aromatic polymer, for example syndiotactic polystyrene. These electrets have good charge retention at elevated temperature (abstract). Further '455 disclose that preferably the syndiotactic vinyl aromatic polymer comprises at least 30% by weight of the composition

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based on the total polymers in the blend. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add the syndiotactic polystyrene in the piezoelectric polymeric material of Yamamoto, motivated by the desire to provide electrets having good charge retention at elevated temperature.

### ***Response to Arguments***

10. Applicant's arguments filed 08/17/06 have been fully considered but they are not persuasive.

The applicant's arguments with respect to rejections over the reference of Yamasaki et al. (US 4,513,049), Miyazaki et al. (US 4,931,505), and Wensley (US 2002/0168564A1) are moot because these rejections are withdrawn.

103 rejections of Yamamoto in view of Chou are maintained for the following reasons. The applicant argues that in order to properly support an obviousness rejection, there must have been some teaching in the prior art to suggest to one skilled in the art that the claimed invention would have been obvious. The examiner recognizes that under Section 103, the obviousness of an invention cannot be established by combining the teachings of the prior art references absent some teaching, suggestion or incentive supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). **This does not mean that the cited prior art references must specifically suggest making the combination.** *B.F. Goodrich Co. M Aircraft Braking Systems Corp.*, 72

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F.3d 1577, 1582, 37 USPQ2d 1314, 1318 (Fed. Cir. 1996); *In re Nilssen*, 851 F.2d 1401, 1403, 7 USPQ2d 1500, 1502 (Fed. Cir. 1988)). Rather, the test for obviousness is what the combined teachings of the prior art references would have suggested to those of ordinary skill in the art. *In re Young*, 927 F.2d 588, 591, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991); *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981).

**This test requires us to take into account not only the specific teachings of the prior art references, but also any inferences which one skilled in the art would**

**reasonably be expected to draw therefrom.** *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968). The primary reference of Yamamoto teaches a

piezoelectric polymeric material in the form of a sheet or film, which comprises polymers of vinylidene fluoride (VDF) as a principle component. The piezoelectric sheet or film of Yamamoto is formed into an electret (abstract). Further, the piezoelectric polymeric sheet or film of Yamamoto comprises copolymers of VDF and chlorotrifluoroethylene (CTFE) (Column 2, lines 20-21). Further Yamamoto also teaches of applying the solution of copolymer (A) and vinylidene fluoride base resin to a substrate. Thus, Yamamoto desires a suitable substrate on which a solution (coating) can be applied.

The secondary reference of Chou is directed to a method of making an electret and further Chou teaches a porous substrate that is used in producing an electret.

Therefore, it would have been obvious to use the porous substrate of Chou in the invention of Yamamoto because Yamamoto desires a substrate and Chou provides such a substrate. Accordingly art rejections are maintained.

**Conclusion**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anish Desai whose telephone number is 571-272-6467. The examiner can normally be reached on Monday-Friday, 8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

APD

  
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